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Climate change regulation: reviewing the market-based approach

About this research

Regulators' efforts to shape business responses to climate change centre on the development of CO₂ markets. These are designed to deliver significant CO₂ emission reductions at the lowest possible cost to industry. However, the potential of these mechanisms is not currently being realised. Research conducted by Dr Gareth Veal (University of Bath), with colleagues at the University of Bath and Lancaster University, explores the problems with the current design of CO₂ markets.

The research recommends that CO₂ emission regulation places more focus on the urgency of climate change mitigation, and provides businesses with the regulatory certainty and incentive to realign their operational and investment priorities. This could be done through simpler forms of regulation, such as taxes or mandates, and by placing responsibility for compliance and reporting with the CEO. The findings are based upon case studies, which examine the operation of the European Emissions Trading Scheme.

Research findings in context: problems with the design of CO₂ markets

The role of business in mitigating climate change represents both an important opportunity, and a significant challenge for industry. The Confederation of British Industry estimates that a £200bn investment in energy infrastructure will be required to meet the UK's target for a 34% cut in CO₂ emissions by 2020. CO₂ markets have been selected as the primary mechanism by which to regulate the business response to climate change, because they offer the potential to deliver CO₂ emission reductions at the lowest possible cost to industry.

Figure 1 illustrates the 'make' or 'buy' decision which is at the heart of the capital efficiency of CO₂ markets. This mechanism is designed to allow the cheapest CO₂ reductions to be targeted first and then redistributed via the CO₂ market. The top facility in the diagram faces cheap options for reducing their CO₂ emissions and therefore 'makes' the required CO₂ savings in-house. Surplus reductions are then sold via the CO₂ market to the second facility, which faces expensive options for in-house reductions and therefore follows the 'buy' option.

Figure 1: CO₂ markets: capital efficiency via the 'Make' or 'Buy' decision



Key findings

Barriers to the operation of CO₂ markets

The research highlights a number of discrepancies between the design of CO₂ markets and their actual operation. These undermine the 'make' or 'buy' decision at the heart of CO₂ markets, which is meant to drive cost effective reductions in business's CO₂ emissions.

- **CO₂ costs are not significant:** CO₂ costs can represent as little as 1% of a company's energy expenditure, too little to influence business behaviour.
- **Businesses respond to CO₂ markets as a compliance exercise, rather than as a market opportunity:** Businesses often do not understand the design or purpose of CO₂ markets. As a result they do not actively engage in CO₂ trading and instead manage their response to CO₂ markets as an exercise in regulatory compliance.
- **Uncertainty blocks action:** CO₂ markets do not give a fixed price for CO₂ in the long-term that is easy to incorporate into investment decisions. Furthermore, their existence is only guaranteed in the short to medium term. Businesses require certainty in the long-term if they are to be persuaded to make climate-friendly investments within capital projects that have lifetimes spanning decades.
- **Time is more important than cost effectiveness:** The emphasis of CO₂ market design on capital efficiency should be relaxed, instead prioritising urgency as the primary design criterion for climate regulation. This would acknowledge the narrow window of opportunity for climate change mitigation, the long lifetimes of large capital projects, and the rising costs of future adaptation due to delays in climate mitigation efforts now.

However, the findings of recent in-depth research by Dr Veal (University of Bath) and others shows that the 'make' or 'buy' mechanism is failing during the actual operation of CO₂ markets. CO₂ markets are therefore not delivering the CO₂ savings anticipated, and their capital efficiency is compromised.

To understand why CO₂ markets such as the European Emissions Trading Scheme are struggling to influence the actual behaviour of businesses, the researchers develop explanations of the discrepancies between CO₂ market design and operation. They show first that regulators (in this case The Environment Agency) and businesses perceive the purpose of, and potential for, CO₂ markets in very different ways. For regulators, CO₂ reduction was seen as a strategic concern for UK-wide industry, incentivised by an absolute price for CO₂. In contrast, individual businesses measured CO₂ costs relative to other expenditures, and in some cases CO₂ costs amounted to less than 1% of annual energy expenditure. This low cost of CO₂ led businesses to describe their engagement with CO₂ markets as an exercise in compliance: a threat to their production processes and product quality which they needed to manage, rather than an opportunity to exploit.

Given these differences in the perceived purpose and potential of CO₂ markets, the research shows that certain technical, temporal and uncertainty-based issues with CO₂ reduction have been ignored by regulators in the design of CO₂ markets. The actual operation of this market does not adequately challenge participating businesses to change their operational decision-making or longer-term capital investments. Specifically, the design of the European Emissions Trading Scheme does not adequately challenge technological reliance on CO₂-intensive production; nor does it acknowledge that businesses are locked into capital investment projects which may be incompatible with reductions in CO₂ emissions within the required timescales; nor, finally, does it provide the certainty that businesses need about how the CO₂ market will work in the future, in order to plan their engagement with it.

As such, the research raises doubts about the ability of CO₂ markets, in their current form, to mitigate climate change, and makes a number of recommendations for the better regulation of CO₂ emissions.

Recommendations for policy makers: considerations for future climate regulation

The research will assist regulators who aim to improve the efficacy of market-based efforts to reduce CO₂ emissions. By enabling better regulation, the research will also help UK industry capitalise upon opportunities to reduce their energy costs and CO₂ emissions, and help to meet the UK's CO₂ reduction targets.

The main policy recommendations concern the design of CO₂ emission regulation (more focus on certainty, urgency and the on-going review of evidence), and how to engage and incentivise businesses (placing responsibility for compliance with climate regulation with senior management, and supporting businesses in realigning their priorities).

Certainty and urgency:

There is a 20-30 year window of opportunity for climate change mitigation. A period often shorter than the lifespan of current capital investments. This means that decisions taken today will significantly influence the success of climate change mitigation efforts in the future. The researchers recommend that regulators should:

- Give at least 30 years of regulatory certainty to match climate change mitigation timescales and the lifetime of large capital investments.
- Acknowledge that the costs resulting from inaction significantly outweigh the costs of action to mitigate climate change, and refocus climate policy to prioritise urgency ahead of capital efficiency.
- Use simpler forms of regulation, such as taxes or mandates.

Policy guidance:

An independent authority should be formed with responsibility for reviewing climate science and advising government on target setting and climate policy.

Point of regulatory intervention:

Responsibility for compliance with climate regulation should be shifted away from local managers at individual sites, and placed (along with a potential criminal liability) with the CEO.

Organisational focus and readiness:

Help businesses to focus upon the end goal of reducing CO₂ emissions (rather than managing their participation with CO₂ markets) by making the means of regulatory compliance straightforward and easy to understand. This supports the case for using simpler policies such as taxes or mandates.

- Require every organisation to name a board member with responsibility for climate change mitigation.
- Ensure that regulations present incentives which are substantial when compared to other operational costs.
- Require all organisations to make their plans for climate change mitigation publicly available, reporting progress against their targets on an annual basis.



Methodology

This research was conducted between January 2009 and May 2010, and employs the case study method in order to examine directly how the intended targets of CO₂ markets (businesses with CO₂-intensive production models) interact with CO₂ markets, such as the European Emissions Trading Scheme. This in-depth method facilitates a fuller understanding of the discrepancies between actual practice and intended practice.

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More on this research:

For more on the discrepancies between CO₂ market design and operation, and how future regulation might take account of the organisational context faced by climate change regulation see:

Veal, Gareth and Mouzas, Stefanos (2012), 'Market-Based Responses to Climate Change: CO₂ Market Design versus Operation', *Organization Studies*, 33 (11), pp. 1589-616.

Veal, G. and Mouzas, S. (2011), 'Changing the rules of the game: Business responses to new regulation', *Industrial Marketing Management*, 40 (2), pp. 290-300.

Hope-Hailey, Veronica and Balogun, Julia (2002), 'Devising Context Sensitive Approaches To Change: The Example of Glaxo Wellcome', *Long Range Planning*, 35 (2), pp. 153-78.



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